THE

AMERICAN JOURNAL OF SCIENCE.

EDITORS

JAMES D. AND EDWARD S. DANA.

ASSOCIATE EDITORS

PROFESSORS JOSIAH P. COOKE, GEORGE L. GOODALE AND JOHN TROWBRIDGE, OF CAMBRIDGE.

PROFESSORS H. A. NEWTON AND A. E. VERRILL, OF NEW HAVEN,

PROFESSOR GEORGE F. BARKER, OF PHILADELPHIA.

Vol. 138

THIRD SERIES.

VOL. XXXVIII.—[WHOLE NUMBER, CXXXVIII.]

Nos. 223—228.

JULY TO DECEMBER, 1889.

WITH XII PLATES.

PUBLIC LIBRARY, DETROIT, MICH. APR 10

NEW HAVEN, CONN.: J. D. & E. S. DANA.
1889.

PRESS OF TUTTLE, MOREHOUSE & TAYLOR, NEW HAVEN, CONN.

CONTENTS OF VOLUME XXXVIII.

Number 223.

Page

ART. I.—A new Erian (Devonian) Plant allied to Cordaites; by Sir WM. DAWSON 1

II.—The Law of Thermal Radiation; by WM. FERREL 3

III.—Stratigraphic Position of the Olenellus Fauna in North America and Europe; by C. D. WALCOTT 29

IV.—Notes on the occurrence of a Leucite Rock in the Absaroka Range, Wyoming Territory; by A. HAGUE 43

V.—On Allotropic Forms of Silver; by M. CAREY LEA 47

IV*a*.—The Peridotite of Pike County, Arkansas; by J. C. BRANNER and R. N. BRACKETT. With Plate I 50

VI.—On Urao; by T. M. CHATARD 59

VII.—Notes on the Crystallization of Trona (Urao); by E. F. AYRES 65

VIII.—On prevailing misconceptions regarding the Evidence which we ought to expect of former Glacial Periods; by J. CROLL 66

IX.—Mineralogical Notes, on Fluorite, Opal, Amber and Diamond; by G. F. KUNZ 72

X.—APPENDIX.—Discovery of Cretaceous Mammalia; by O. C. MARSH. With Plates II, III, IV, and V 81

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—On the action of Hydrogen peroxide on Chromic Acid, BERTHELOT: On the Atomic Mass of Chromium, RAWSON, 74.—On the new Element Gnomium, MÜLLER: Concentration of Electric Radiation by lenses, LODGE and HOWARD: Wave-length of the principal line in the Spectrum of the Aurora, HUGGINS, 75.—Quartz as an insulator, BOYS: Light and Magnetism, S. BIDWELL: Telephonic vibrations, FRÖHLICH, 76.—On an Electrostatic Field produced by varying Magnetic Induction, LODGE and CHALTOCK, 77.

Geology and Mineralogy.—Fossil Fishes and Fossil Plants of the Triassic Rocks of New Jersey and the Connecticut Valley, J. S. NEWBERRY, 77.—Map of the rigion of Duck and Riding Mountains in Northwestern Manitoba, J. B. TYRRELL: Bulletin of the American Museum of Natural History, J. A. ALLEN and R. P. WHITFIELD, 78.—Plattnerite from Idaho, H. A. WHEELER, 79.

Miscellaneous Scientific Intelligence.—Luminous night-clouds, 79.—American Association for the Advancement of Science: Sir Wm. Dawson on New Erian Plant, 80.

Number 224.

Page

ART. XI.—Observation of Sudden Phenomena; by S. P. LANGLEY 93

XII.—Spectro-photometric Comparison of Sources of Artificial Illumination; by EDWARD L. NICHOLS and WILLIAM S. FRANKLIN 100

XIII.—Possibility of Hemihedrism in the Monoclinic Crystal System, with especial reference to the Hemihedrism of Pyroxene; by GEORGE H. WILLIAMS 115

XIV.—Earlier Cretaceous Rocks of the Northwestern portion of the Dominion of Canada; by GEORGE M. DAWSON 120

XV.—A new occurrence of Gyrolite; by F. W. CLARKE.. 128

XVI.—Action of Light on Allotropic Silver; by M. CAREY LEA 129

XVII.—Certain Porphyrite Bosses in Northwestern New Jersey; by J. F. KEMP 130

XVIII.—Great lava flows and intrusive trap sheets of the Newark system in New Jersey; by NELSON H. DARTON 134

XIX.—Recent Explorations in the Wappinger Valley Limestones and other formations of Dutchess Co., N. Y.; by W. B. DWIGHT. (With Plate VI.) 139

XX.—Silicic Acids; by GEORGE F. BECKER 154

XXI.—APPENDIX.—Notice of Gigantic Horned Dinosauria from the Cretaceous; by O. C. MARSH 173

XXII.—Discovery of Cretaceous Mammalia. Part II; by O. C. MARSH. (With Plates VII and VIII.) 177

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—Vapor Density of hydrogen fluoride, THORPE and HAMBLY, 157.—Decomposition of Potassium chlorate by heat, MCLEOD, 158.—Synthesis of Formic aldehyde, JAHN, 159.—Identity of Seminose and Mannose, E. FISCHER and HIRSCHBERGER: Synthesis of Uric acid, BEHREND and ROOSEN: Crystallized Tungsten, R. N. RIDDLE, 160.—Influence of Solar radiation on Electrical phenomena, S. ARRHENIUS, 161.—Disruptive discharges in gases, M. WOLF: Selective reflection of Metals, H. RUBENS, 163.

Geology and Mineralogy.—Tertiary Volcanoes of the Western Isles of Scotland, J. W. JUDD, 163.—Genus Tubicaulis of Cotta, G. STENZEL: Faune du Calcaire d'Erbray (Loire Inférieure), C. BARROIS: Notes on Epidote and Hanksite. C. BODEWIG, 164.—Plattnerite from Idaho, J. D. HAWKINS and E. W. HAWKINS, 165.—The Minerals of New South Wales, etc., A. LIVERSIDGE: Eighth Annual Report of the State Mineralogist of California, W. IRELAN, 166.

Botany and Zoology.—Beiträge zur Kenntniss der Oxidationsvorgänge in lebenden Zellen, PFEFFER: Biologia Central-Americana, HEMSLEY, 166.—A Hand-Book of Cryptogamic Botany, A. W. BENNETT, 168.—Bathymetric conditions as to growing corals and other species of Tizard and Macclesfield Banks, in the China Sea. W. U. MOORE and P. W. BASSETT-SMITH: The Coral Reefs of the Hawaiian Islands, A. AGASSIZ: Fisheries and Fishing Industries of the United States, G. B. GOODE, 169.—Darwinism, A. R. WALLACE, 170.

Astronomy.—Researches on the Spectrum, Visible and Photographic, of the Great Nebula in Orion, HUGGINS, 170.

Miscellaneous Scientific Intelligence.—Elizabeth Thompson Science Fund: The Assayer's Manual, B. KERL and F. L. GARRISON, 172.

Obituary.—JOHN PERCY: MARIA MITCHELL.

Number 225.

Page

ART. XXIII.—Feasibility of establishing a Light-wave as the Ultimate Standard of Length; by A. A. MICHELSON and E. W. MORLEY 181

XXIV.—Carboniferous Echinodermata of the Mississippi Basin; by C. R. KEYES 186

XXV.—Energy Potentialized in Permanent Changes of Molecular Configurations; by C. BARUS 193

XXVI.—Contributions to Mineralogy, No. 44; by F. A. GENTH 198

XXVII.—Period of Rotation of the Sun; by H. CREW 204

XXVIII.—"Grand Gulf" Formation of the Gulf States; by L. C. JOHNSON 213

XXIX.—Radiant Energy and Electrical Energy; by J. TROWBRIDGE 217

XXX.—Note on the fossil Spider, Arthrolycosa antiqua of Harger; by C. E. BEECHER 219

XXXI.—Paragenesis of Allanite and Epidote as Rock-forming Minerals; by W. H. HOBBS 223

XXXII.—New locality of the Camptonite of Hawes and Rosenbusch; by F. L. NASON 229

XXXIII.—Determination of the value of the B. A. Unit of Resistance in Absolute measure, by the method of Lorenz; by L. DUNCAN, G. WILKES and C. T. HUTCHINSON 230

XXXIV.—Properties of Allotropic Silver; by M. C. LEA ... 237

XXXV.—Ring Systems and other Curve Systems produced on Allotropic Silver by Iodine; by M. C. LEA 241

XXXVI.—Notes on some Native Iron Sulphates from Chili; by J. B. MACKINTOSH 242

SCIENTIFIC INTELLIGENCE.

Physics.—Electrical Waves in Conductors, HERTZ, 246.—Disintegration of Surfaces by means of the Ultra Violet rays, P. LENARD and M. WOLF, 247.

Geology and Mineralogy.—Eruption of Baldai-san, in Northern Japan, on July 15, 1888, Y. KIKUCHI, 247.—Mastodon or Elephas with fragments of charcoal at Attica, Wyoming Co., N. Y., J. M. CLARKE: Illustrations of the Fossil Fishes of the Devonian Rocks of Canada, J. F. WHITEAVES: Notices of some recently described minerals, 249.—Lehrbuch der Mineralogie, C. HINTZE, 251.—Mazapilite, KOENIG, 252.

Botany and Zoology.—Ueber Entstehung und Wachsthum der Zellhaut, E. ZACHARIAS: Volvox, L. KLEIN, 252.—Zur Kenntniss der fixen Lichtlage der Laubblätter, G. KRABBE: Flora, oder Allgemeine botanische Zeitung: Utilization by plants of free atmospheric nitrogen: Monographiæ Phanerogarum Prodromi nunc continuatio, nunc revisio Editoribus et pro parte auctoribus ALPHONSO et CASIMIR DE CANDOLLE. Vol. Sextum. Andropogoneæ, auctore, E. HACKEL, 253.—Angewandte Pflanzenanatomie, A. TSCHIRCH: Report on the Mollusca from dredgings of the Steamer "Blake," H. DALL, 254.

Miscellaneous Scientific Intelligence.—Soaping Geysers, A. HAGUE, 254.—Proceedings of the Colorado Society, Part I: Chemistry of Photography, R. MELDOLA, 255.—Ostwald's Klassiker der exakten Wissenschaften, 256.

Obituary.—ELIAS LOOMIS, 256.

Number 226.

Page

ART. XXXVII.—Origin of Normal Faults and of the Structure of the Basin region; by J. LECONTE 257

XXXVIII.—Circular Polarization of certain Tartrate Solutions, II; by J. H. LONG 264

XXXIX.—Gustatory Organs of the American Hare, Lepus Americanus; by F. TUCKERMAN 277

XL.—Output of the Non-condensing Steam Engine, as a Function of Speed and Pressure; by F. E. NIPHER 281

XLI.—Ratio of the Electromagnetic to the Electrostatic Unit of Electricity; by H. A. ROWLAND, with the assistance of E. H. HALL and L. B. FLETCHER 289

XLII.—Determination of v, the ratio of the Electromagnetic to the Electrostatic Unit; by E. B. ROSA 298

XLIII.—Some suggestions upon the method of grouping the formations of the middle Cretaceous and the employment of an additional term in its nomenclature; by G. H. ELDRIDGE 313

XLIV.—Some Florida Miocene; by D. W. LANGDON, JR. ... 322

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—Heat of Combustion of Carbon, BERTHELOT and PETIT, 324.—Molecular Mass of Dissolved Substances, WILL and BREDIG, 325.—Boiling point of Ozone and the Solidifying point of Ethylene, OLZEWSKI, 326.—Constitution of the Thionic acids, BERTHELOT, 327.

Geology and Mineralogy.—Geological Society of America: North American Geology and Palæontology, S. A. MILLER, 328.—Note on the composition of Uraninite, W. F. HILLEBRAND: Minerals from Franklin, N. J., G. A. KOENIG, 329.

Miscellaneous Scientific Intelligence.—Parallaxes of the fixed stars, 329.—American Association for the Advancement of Science, 331.

Obituary.—GIUSEPPE MENEGHINI, GEORGE H. COOK, 336.

ERRATA.

Pages 323, 324, for Sumpter, read Sumter.
Page 329, line 20, for NO_2 read UO_2.

Number 227.

Page

ART. XLV.—Mathematical Theories of the Earth; by R. S. WOODWARD 337

XLVI.—Darkened Silver Chloride not an Oxychloride; by M. CAREY LEA 356

XLVII.—Observations on some of the Trap Ridges of the East Haven-Branford Region, with a map (Plate IX); by E. O. HOVEY 361

XLVIII.—Theory of the Mica Group; by F. W. CLARKE .. 384

XLIX.—Probable Law of Densities of the Planetary Bodies; by R. HOOKE 393

L.—Improved Standard Clark Cell with Low Temperature Coefficient; by H. S. CARHART 402

LI.—Pseudomorphs of Native Copper after Azurite, from Grant County, New Mexico; by W. S. YEATES 405

LII.—Note on the Relation of Volume, Pressure and Temperature in case of Liquids; by C. BARUS 407

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—Colloidal Cellulose, GUIGNET, 408.—Watts' Dictionary of Chemistry, H. F. MORLEY and M. M. P. MUIR, 409.—Treatise on the Principles of Chemistry, M. M. P. MUIR: Definitions adopted by the International Congress of Electricians, MASCART, 410.—Lightning and the Eiffel Tower: Transmission of power by Electricity, DEPREZ: Dissipation of negative electric charges by sunlight and daylight, J. ELSTER and H. GEITEL: Photography of the invisible portions of the Solar Spectrum, CH. V. ZENGER: Carbon Spectrum, H. KAYSER and C. RUNGE, 411.

Geology.—Movement of the Upper ice of Glaciers over the Lower: Ice-Age in North America, and its bearings on the Antiquity of Man, G F. WRIGHT, 412.—Annual Report of the Geological Survey of Arkansas for 1888, J. C. BRANNER, 413.—Jurassic Plants from Kaga, Hida, and Echizen, (Japan), MATAJIRO YOKOYAMA: Rivers and Valleys of Pennsylvania, W. M. DAVIS, 414.

Botany and Zoology.—Die natürlichen Pflanzenfamilien, A. ENGLER and K. PRANTL: Guide pratique pour les travaux de Micrographie. BEAUREGARD et GALLIPPE: Contributions to the Physiology of Growth, J. WORTMANN, 415.—Atlas deutscher Meeresalgen, F. SCHÜTT, P. KUCKUCK, J. REINKE, 416.—Monograph of the Horney Sponges, R. VON LENDENFELD, 417.—The Bermuda Islands; a Contribution to the Physical History and Zoology of the Somers Archipelago with an examination of the structure of Coral Reefs, A. HEILPRIN, 418.

Miscellaneous Scientific Intelligence.—British Association: Scientific Papers of Asa Gray, C. S. SARGENT, 419.—Popular Treatise on the Winds, W. FERREL: Sixth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, J. W. POWELL: Elementary Algebra, R. GRAHAM: Numbers Universalized, an Advanced Algebra, D. M. LENSENIG, 420.

ERRATA.

Page 371, line 8 from top, after *railroad* add *cut;* p. 372, line 9 from bottom, for *welded* read *joined;* p. 374, line 19 from bottom, after 450 add *feet;* p. 375, line 11 from top, for E 2 read E 1.

Number 228.

Page

ART. LIII.—Temperature of the Moon; by S. P. LANGLEY, with the assistance of F. W. VERY 421

LIV.—Lower Cretaceous of the Southwest and its relation to the underlying and overlying formations; by C. A. WHITE 440

LV.—Hinge of Pelecypods and its Development, with an attempt toward a better subdivision of the group; by W. H. DALL 445

LVI.—Magnetism of Nickel and Tungsten Alloys; by J. TROWBRIDGE and S. SHELDON 462

LVII.—Note on the Measurement of the Internal Resistance of Batteries; by B. O. PEIRCE and R. W. WILLSON ... 465

LVIII.—Relation of the Uppermost Cretaceous Beds of the Eastern and Southern United States; by R. T. HILL: and the Tertiary Cretaceous Parting of Arkansas and Texas; by R. T. HILL and R. A. F. PENROSE, Jr. 468

LIX.—Description of several Yttria and Thoria Minerals from Llano County, Texas; by W. E. HIDDEN and J. B. MACKINTOSH 474

LX.—APPENDIX.—Skull of the Gigantic Ceratopsidæ; by O. C. MARSH. With Plate XII 501

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics.—Spectroscopic Discrimination of the Rarer Earths, CROOKES, 486.—Commercial Organic Analysis, A. H. ALLEN, 490.—Text Book of Organic Chemistry, A. BERNTHSEN: The spectrum of Hydrogen: Spectrum of gases at low temperature: New photographic lens: Pin-hole Photography: Blue color of the sky, 491.—Passage of Electricity through gases: Purification of Sewage by Electricity: Elementary Lessons in Heat, S. E. TILLMAN, 492.

Geology and Mineralogy.—Tertiary Flora of Australia, Dr. CONSTANTIN: Royal Society of Canada: Contributions to Canadian Palæontology, Canada, J. F. WHITEAVES: Chemical and Physical Studies in the Metamorphism of Rocks, A. IRVING, 493.—Eudialyte (?), W. E. HIDDEN and J. B. MACKINTOSH: Catalogue of Minerals and Synonyms alphabetically arranged for the use of Museums, T. EGLESTON: Materialen zur Mineralogie Russlands, KOKSCHAROW: Index der Krystallformen der Mineralien, V. GOLDSCHMIDT: Einleitung in die Chemische Krystallographie, A. FOCK, 494.—Composition of uraninite, 495.

Botany.—What is a Phyllodium?, 495.

Miscellaneous Scientific Intelligence.—National Academy: New Bulletins of the U. S. National Museum, published by the Smithsonian Institution in 1889, 498.

Obituary.—GEORGE H. COOK, 498.—LEO LESQUEREUX, 499.—JAMES PRESCOTT JOULE, 500.

INDEX TO VOLUME XXXVIII, 501.

ERRATUM.

The notes at the bottom of p. 476 should be transposed.

V